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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,966	02/28/2005	Yozo Shoji	1640.1033	3180

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EXAMINER	
FLORES, LEON	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,966	SHOJI ET AL.	
	Examiner	Art Unit	
	LEON FLORES	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _09 October 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-8_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-8_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/9/2008 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims (1, 4, 5, 8) have been considered but are moot in view of the new ground(s) of rejection.

Response to Remarks

Applicant asserts that *"AAPA describes modulation/demodulation performed using local oscillation signals generated in each of the wireless communication terminals. The local oscillation signals are not a reference local oscillation that is regenerated in each station from the same reference local oscillation signal output by a transmitting station as recited in claim 1".*

The examiner respectfully disagrees. One skilled in the art would know that in order to achieve synchronization between a transmitter (base station) and a receiver (mobile station) the transmitter must be able to transmit a reference signal

(synchronization signal) to the receiver. Prior art does suggest the teaching of regenerating a reference signal sent by the transmitter in order to achieve synchronization. (See fig. 7 & ¶s 3-4)

Applicant finally asserts that *“Meidan discloses that wireless communication terminals synchronize their local oscillation signals using a reference time received from a GPS. The reference time received from the GPS is not the same as a reference local oscillation that is regenerated in each station from the same reference local oscillation signal as recited in claim 1".*

The examiner respectfully disagrees. The reference of Meidan does teach transmitting a synchronization signal (reference signal) to a receiver in order to achieve synchronization. (See figs. 1 & 2. col. 6, lines 61-65 & col. 10, lines 10-25) This synchronization signal (146, 149) is forwarded to a GPS receiver and a controller (regenerated) and then used by a local oscillator to achieve synchronization.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims (1-3 & 5-7) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (hereinafter Prior art) in view of Meidan et al. (hereinafter Meidan) (US Patent 5,506,863)**

Re claim 1, Prior art discloses a frequency hopping wireless communication method for performing communications between a plurality of wireless communication terminals, each wireless communication terminal having a transmitting unit for generating a radio modulation signal by multiplying an intermediate frequency band modulation signal from an intermediate frequency band modem by a local oscillation signal, and a receiving unit for generating an intermediate frequency band demodulation signal downconverted by multiplying a radio modulation signal by a local oscillation signal, and demodulating the signal in the intermediate frequency band modem, the frequency hopping wireless communication method comprising:
amplifying and band filtering the received signal. (See fig. 7: 8, 9)

But the reference of Prior art fails to explicitly teach transmitting a reference local oscillation signal from a transmitting station; receiving the reference local oscillation signal from the transmitting station, regenerating the reference local oscillation signal by an injection synchronous oscillator or an amplifier in each of the wireless communication terminals.

However, Meidan does. (See figs. 1 & 2 & col. 10, lines 10-25) Meidan discloses transmitting a reference local oscillation signal from a transmitting station (156); receiving the reference local oscillation signal from the transmitting station (146, 149), regenerating the reference local oscillation signal by an injection synchronous oscillator or an amplifier in each of the wireless communication terminals. (See col. 6, lines 61-63, col. 10, lines 10-25)

Therefore, taking the combined teaching of Prior art and Meidan as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, in the manner as claimed and as taught by Meidan, for the benefit of achieving synchronization between the two devices.

The combination of Prior art and Meidan fails to explicitly teach modulating a transmission signal in a frequency hopping system using the regenerated reference local oscillation; and performing mutual communications using the transmission signal which is demodulated in each receiving wireless communication terminal of the plurality of wireless communication terminals using the regenerated reference local oscillation.

However, the reference of Meidan does suggest (See figs. 1 & 2) modulating a transmission signal in a frequency hopping system using the regenerated reference local oscillation (146, 149, 114, 116, 106); and performing mutual communications using the transmission signal which is demodulated in each receiving wireless communication terminal of the plurality of wireless communication terminals using the regenerated reference local oscillation. (124, 120, 141, 128 & col. 6, lines 61-65 & col. 10, lines 10-25)

Therefore, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, as modified by Meidan, for the benefit of maintaining synchronization between the two devices.

Re claim 2, the combination of Prior art and Meidan further discloses a dedicated transmitting station for transmitting only the reference local oscillation signal. (In Meidan, see fig. 2: 146 & col. 6, line 36 - col. 7, line 15)

Re claim 3, the combination of Prior art and Meidan further discloses that wherein one wireless communication terminal of the plurality of wireless communication terminals acts as a base station or a parent station, and transmits a local oscillation signal for use in the base station or the parent station together with a radio modulation signal (In Meidan, see fig. 2: 146 & col. 6, line 36 - col. 7, line 15), and each child station, which is any wireless communication terminal of the plurality of wireless communication terminals other than the one wireless communication terminal acting as the base station or the parent station, receives the reference local oscillation signal transmitted by the base station or the parent station. (In Meidan, see fig. 1 & col. 6, line 36 - col. 7, line 15. Furthermore, one skilled in the art would know that a base station may use from a variety of communication protocols "frequency hopping system" in order to communicate with multiple mobile stations within a cell.)

Re claim 5, Prior art discloses a frequency hopping wireless communication system comprising: a transmitting station for transmitting a reference local oscillation signal (See fig. 6 & ¶ 3); and a plurality of wireless communication terminals (“frequency hopping system), each wireless communication terminal having: a receiving unit that amplifies and band filters a signal received from the transmitting station to regenerate the reference local oscillation signal by an injection synchronous oscillator or an amplifier, and generates an intermediate frequency band demodulation signal downconverted by multiplying a received radio modulation signal by the reference oscillation signal, and demodulates the intermediate frequency band demodulation signal in the intermediate frequency band modem. (See fig. 7)

But the reference of Prior art fails to explicitly teach a transmitting unit that generates and transmits a radio modulation signal by multiplying an intermediate frequency band modulation signal from an intermediate frequency band modem by the reference local oscillation signal.

However, Meidan does. (See figs. 1 & 2) Meidan discloses a transmitting unit that generates and transmits a radio modulation signal by multiplying an intermediate frequency band modulation signal from an intermediate frequency band modem by the reference local oscillation signal. (146, 149)

Therefore, taking the combined teaching of Prior art and Meidan as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, in the manner as claimed and as taught by Meidan, for the benefit of achieving synchronization between the two devices.

Claim 6 is a system claim corresponding to method claim 2. Hence, the steps performed by method claim 2 would have necessitated the elements in system claim 6. Therefore, claim 6 has been analyzed and rejected w/r to claim 2 above.

Claim 7 is a system claim corresponding to method claim 3. Hence, the steps performed by method claim 3 would have necessitated the elements in system claim 7. Therefore, claim 7 has been analyzed and rejected w/r to claim 3 above.

1. **Claims (4 & 8) are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (hereinafter Prior art) in view of Meidan et al (hereinafter Meidan) (US Patent 5,506,863), and further in view of Wakayama (US Patent 6,130,905) and Yozo Shoji et al. (hereinafter Yozo) "Proposal of Millimeter-wave Self-heterodyne Communication System", Communications Research Laboratory, Ministry of Posts and Telecommunications, June 2000.**

Re claim 4, Prior art discloses a frequency hopping wireless communication method for performing communications between a plurality of wireless communication terminals each wireless communication terminal having a transmitting unit for generating a radio modulation signal by multiplying an intermediate frequency band modulation signal from an intermediate frequency band modem by a local oscillation signal, and a receiving unit for generating an intermediate frequency band demodulation signal downconverted by multiplying a radio modulation signal by a local oscillation signal, and demodulating the signal in the intermediate frequency band modem, the

frequency hopping wireless communication method comprising: upconverting a modulation signal generated in an intermediate frequency band to a radio frequency band using a local oscillation signal functioning as a hopping synthesizer by the transmitting unit in each of the plurality of wireless communication terminals, and simultaneously transmitting a frequency hopping radio modulation signal of a single-side band wave or a both- side band wave obtained by the upconverting, and the local oscillation signal used in the upconverting. (See fig. 6. Furthermore, one skilled in the art would know that single side band and double side band is well known in the art.)

But the reference of Prior art fails to teach downconverting a received signal by the receiving unit to a first intermediate frequency band signal using a local oscillation signal frequency hopping in a pattern obtained by adding a fixed frequency offset to a frequency hopping pattern corresponding to a desired reception wave.

However, Meidan does. (See figs. 1, 2: 108, 120, 122, 128, 141, 142 & col. 8, lines 6-50) Meidan discloses downconverting a received signal by the receiving unit to a first intermediate frequency band signal using a local oscillation signal frequency hopping in a pattern obtained by adding a fixed frequency offset to a frequency hopping pattern corresponding to a desired reception wave.

Therefore, taking the combined teaching of Prior art and Meidan as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, in the manner as claimed and as taught by Meidan, for the benefit of achieving synchronization between the two devices.

The combination of Prior art and Meidan discloses the limitations as claimed above, except they fail to explicitly teach extracting two signal components, a local oscillation signal component that is the local oscillation signal used in the upconverting the modulation signal, and a modulation signal component, by passing the downconverted signal through a band pass filter.

However, Wakayama does. (See figs. 1 & 3) Wakayama discloses extracting two signal components, a local oscillation signal component that is the local oscillation signal used in the upconverting the modulation signal, and a modulation signal component, by passing the downconverted signal through a band pass filter. (One skilled in the art would know that band pass filters are well known components in transceivers.)

Therefore, taking the combined teaching of Prior art, Meidan, and Wakayama as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, as modified by Meidan, in the manner as claimed and as taught by Wakayama, for the benefit of performing synchronization in the transceiver.

The combination of Prior art, Meidan, and Wakayama discloses the limitations as claimed above, except they fail to explicitly teach generating a product component of the two signal components, thereby regenerating a second intermediate frequency band modulation signal.

However, Yozo does. (See fig. 4 & sections 2 & 3, equation 2) Yozo discloses a receiver that performs square-law detection wherein generating a product component of

the two signal components, thereby regenerating a second intermediate frequency band modulation signal.

Therefore, taking the combined teaching of Prior art, Meidan, Wakayama, and Yozo as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, as modified by Meidan and Wakayama, in the manner as claimed and as taught by Yozo, for the benefit of eliminating the influence of the phase noise and frequency offset caused by mixing the local carrier at the transmitter. (See sections 1 & 2)

Re claim 8, Prior art discloses a frequency hopping wireless communication system, comprising: a plurality of wireless communication terminals (“frequency hopping system”), each wireless communication terminal having a transmitting unit for generating a radio modulation signal by multiplying an intermediate frequency band modulation signal from an intermediate frequency band modem by a local oscillation signal (See fig. 6), and a receiving unit for generating an intermediate frequency band demodulation signal downconverted by multiplying a radio modulation signal by a local oscillation signal, and demodulating the signal in the intermediate frequency band modem, wherein in each of the plurality of wireless communication terminals, the transmitting unit upconverts a modulation signal generated in an intermediate frequency band to a radio frequency band using a local oscillation signal functioning as a hopping synthesizer, and simultaneously transmits a frequency hopping radio modulation signal of a single-side band wave or a both-side band wave obtained by the upconversion and

the local oscillation signal used in the upconversion. (See fig. 6. Furthermore, one skilled in the art would know that single side band and double side band is well known in the art.)

But the reference of Prior art fails to teach the receiving unit downconverts a received signal to a first intermediate frequency band signal using a local oscillation signal frequency hopping in a pattern obtained by adding a fixed frequency offset to a frequency hopping pattern corresponding to a desired reception wave.

However, Meidan does. (See figs. 1, 2: 108, 120, 122, 128, 141, 142 & col. 8, lines 6-50) Meidan discloses the receiving unit downconverts a received signal to a first intermediate frequency band signal using a local oscillation signal frequency hopping in a pattern obtained by adding a fixed frequency offset to a frequency hopping pattern corresponding to a desired reception wave.

Therefore, taking the combined teaching of Prior art and Meidan as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, in the manner as claimed and as taught by Meidan, for the benefit of achieving synchronization between the two devices.

The combination of Prior art and Meidan discloses the limitations as claimed above, except they fail to explicitly teach that it extracts two signal components, that is, a local oscillation signal component that is the local oscillation signal used in the upconverting the modulation signal, and a modulation signal component, by passing the downconverted signal through a band pass filter.

However, Wakayama does. (See figs. 1 & 3) Wakayama that it extracts two signal components, that is, a local oscillation signal component that is the local oscillation signal used in the upconverting the modulation signal, and a modulation signal component, by passing the downconverted signal through a band pass filter. (One skilled in the art would know that band pass filters are well known components in transceivers.)

Therefore, taking the combined teaching of Prior art, Meidan, and Wakayama as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, as modified by Meidan, in the manner as claimed and as taught by Wakayama, for the benefit of performing synchronization in the transceiver.

The combination of Prior art, Meidan, and Wakayama discloses the limitations as claimed above, except they fail to explicitly teach that it generates a product component of the two signal components, thereby regenerating a second intermediate frequency band modulation signal.

However, Yozo does. (See fig. 4 & sections 2 & 3, equation 2) Yozo discloses a receiver that performs square-law detection wherein it generates a product component of the two signal components, thereby regenerating a second intermediate frequency band modulation signal.

Therefore, taking the combined teaching of Prior art, Meidan, Wakayama, and Yozo as a whole, it would have been obvious to one of ordinary skills in the art to incorporate these features into the system of Prior art, as modified by Meidan and

Wakayama, in the manner as claimed and as taught by Yozo, for the benefit of eliminating the influence of the phase noise and frequency offset caused by mixing the local carrier at the transmitter. (See sections 1 & 2)

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON FLORES whose telephone number is (571)270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. F./
Examiner, Art Unit 2611
December 4, 2008

/David C. Payne/
Supervisory Patent Examiner, Art Unit 2611